

CLAIMS:

1. An electromechanical transducer (1) for transducing an electrical input signal into an electrical output signal, the transducer comprising:
 - a substrate (10),
 - an electrically conductive resonator element (20) attached to the substrate (10),5 the resonator element (20) extending in a longitudinal direction having a length (l),
 - an electrically conductive actuator (30) able to receive an electrical actuation potential difference with respect to the resonator element for inducing an elastic deformation of the resonator element (20), the actuation potential difference being a function of the input signal, the elastic deformation comprising a change (dl) of the length (l), the resonator10 element (20) comprising a resistor with an ohmic resistance which is a function of the change (dl) of the length (l), the output signal being a function of the resistance.
2. A transducer (1) as claimed in claim 1, wherein the resonator element (20) comprises a first part (201) having a first length in longitudinal direction, and a second part (202) having a second length in longitudinal direction, the elastic deformation comprising a change of the first length which is counteracted by a first elastic force (F_1), and a change of the second length which is counteracted by a second elastic force (F_2), the first elastic force (F_1) and the second elastic force (F_2) substantially compensating each other ($F_1+F_2 \approx 0$) in a deformation-free part (203) of the resonator element (20), the resonator element (20) being
15 attached to the substrate (10) in a support area (204) comprised in the deformation-free part (203).
3. A transducer (1) as claimed in claim 2, wherein the support area (204) comprises a first resonator contact (250) and a second resonator contact (260) that is
20 electrically connected to the first resonator contact (250) by a conductive path comprised in the resonator element (20), the conductive path comprising a point (P) outside the deformation-free part (203).

4. A transducer (1) as claimed in claim 3, wherein the resonator element (20) has an outer end in longitudinal direction, the point (P) being at the outer end.

5. A transducer (1) as claimed in claim 3, wherein the resonator element (20) comprises a first material with a first electric conductivity constituting the conductive path, and a second material with a second electric conductivity which is smaller than the first electric conductivity, every path from the first resonator contact (250) to the second resonator contact (260) which is free from the point (P) comprising the second material.

10 6. A transducer (1) as claimed in claim 5, wherein the second material comprises a dielectric material.

7. A transducer (1) as claimed in claim 1, wherein the resonator element (20, 20a) is included in a Wheatstone-type electric circuit, the Wheatstone-type electric circuit 15 comprises a first contact area (25) and a second contact area (26), the first contact area (25) being electrically connected to the second contact area (26) via a first connection and via a second connection arranged parallel to the first connection, the first connection comprising the resonator element (20, 20a) in series with a second resonator element (20b), the second connection comprising a third resonator element (20c) in series with a fourth resonator 20 element (20d), the resonator element (20a) and the second resonator element (20b) being connected by a first electrical connector comprising a measurement point (28), and the third resonator element (20c) and the fourth resonator element (20d) being connected by a second electrical connector comprising a reference point (29), the output signal comprising an electrical potential difference between the measurement point and the reference point, the 25 second resonator element (20b), the third resonator element (20c) and the fourth resonator element (20d) each being substantially identical to the resonator element (20a).

8. A transducer (1) as claimed in claim 7, wherein:

- the resonator element (20a) is situated between the first contact area (25) and 30 the second resonator element (20b),
- the third resonator element (20c) is situated between the second contact area (26) and the fourth resonator element (20d), and
- a second electrically conductive actuator (30c) for elastically deforming the third resonator element (20c) is present.

9. A transducer (1) as claimed in claim 8, wherein:
- a third electrically conductive actuator (30b) for elastically deforming the second resonator element (20b) is present, and
 - 5 - a fourth electrically conductive actuator (30d) for elastically deforming the fourth resonator element (20d) is present.

10. A transducer (1) as claimed in claim 1, wherein:
- the resonator element (20) comprises a first resonator element (20e) and a second resonator element (20f), the first resonator element (20e) and the second resonator element (20f) being mechanically coupled by a coupling element (16),
 - the actuator (30) is able to induce an elastic deformation of the first resonator element (20e), and
 - the second resonator element (20f) constitutes a resistor with an ohmic resistance which is a function of the change (dl') of the length (l') of the second resonator element (20f), the output signal being a function of the resistance of the second resonator element.

11. An electronic device (50) comprising:
- 20 - a signal processor (51) operating with a clock signal, and
- a transducer (1) as claimed in Claim 1 for providing the clock signal.